CHAPTER 1

Executive Summary

This is the twenty-third annual report documenting air pollution trends in the United States.[1–22] The primary emphasis of this report is on those pollutants for which the United States Environmental Protection Agency (EPA) has established National Ambient Air Quality Standards (NAAQS). EPA set these standards to protect public health and welfare. Primary standards are designed to protect public health, including sensitive populations such as children and the elderly, while secondary standards protect public welfare, such as the effects of air pollution on vegetation, materials, and visibility. There are six *criteria* pollutants with primary standards: carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO_2), ozone (O_3), particulate matter whose aerodynamic size is less than or equal to 10 micrometers (PM-10), and sulfur dioxide (SO_2).

This report tracks two kinds of trends for the criteria pollutants. **Air quality concentrations** are based on actual direct measurements of pollutant concentrations in the air at selected monitoring sites across the country, while **emissions** are calculated estimates of the total tonnage of these pollutants released into the air annually. Emissions estimates are derived from many factors, including the level of industrial activity, technology changes, fuel consumption, vehicle miles traveled (VMT), and other activities that cause air pollution. Emissions numbers also reflect changes in air pollution regulations and the installation of controls on the sources of emissions. Additional information on emissions estimates are contained in the companion report, *National Air Pollutant Emission Trends, 1900–1995.*[23]

The criteria pollutant analyses reported in Chapter 2 focus primarily on 10-year trends. Long-term trends based on available data from the 1970s and early 1980s are also provided. Additionally, changes in pollutant concentrations over the past year, and one-year snapshots of pollutant concentrations and emissions categories for 1995 are presented.

Figure 1-1 summarizes the long-term changes in emissions for all six NAAQS pollutants between 1970 and 1995. Emissions are used to portray long-term trends because they are available for longer time periods than air quality concentrations. The figure shows that emissions for all criteria pollutants except nitrogen oxides decreased between 1970 and 1995, the greatest improvement being a 98 percent decrease in lead emissions. These reductions occurred during a period of significant population and economic growth. Since 1970, total U.S. population increased 28 percent, VMT increased 116 percent, and the gross domestic product increased 99 percent, as noted in Figures 1-2 through 1-4.

Ten-year trends in air quality and emissions are summarized below:

Ten-Year Air Quality and Emissions Trends 1986–1995

	Air Quality % Change	Emissions % Change
Carbon Monoxide	-37%	-16%
Lead	-78%	-32%
Nitrogen Dioxide	-14%	-3% (NOx)
Ozone	-6%	-9% (VOC)
PM-10*	-22%	-17%
Sulfur Dioxide	-37%	-18%

*PM-10 % changes are based on 1988-1995 data.

Improvements in air quality between 1986 and 1995 are a direct result of effective implementation of clean air laws and regulations. Despite the growth in U.S. population,[24] total

VMT,[25] and gross domestic product[24] since 1970, there is strong evidence of a general trend of air quality improvement. This improvement is supported by the observed decrease in emissions of all criteria pollutants over the past 10 years.

While progress has been made, it is important not to lose sight of the magnitude of the air pollution problem that still remains. Based upon monitoring data submitted to EPA's data base, approximately 80 million people in the United States reside in counties that did not meet the air quality standard for at least one of the NAAQS pollutants for the single year 1995. Ground level ozone is the largest problem, based on both population and number of areas not meeting the standards. In 1995, 71 million people lived in counties that exceeded the ozone standard. These exceedances are due in part to the hot, dry summer which was conducive to ozone formation. However, 1995 is the fourth consecutive year that every monitoring site in the country met the NO_2 standard. With respect to SO_2, it is important to note that while most monitoring sites are currently meeting ambient standards, SO_2 problems in the United States are usually localized and are caused by point sources that are typically identified by modeling rather than by routine ambient monitoring.

The population estimates in Figure 1-5 are based upon only a single year of data, 1995, and only consider counties with monitoring data for each pollutant. These population estimates are intended to provide a relative measure of the extent of the problem for each pollutant in 1995. An individual *living* in a county may not actually be *exposed* to unhealthy air.

The number of people living in nonattainment areas as of August 1996 was approximately 127 million (based on the formal designations of nonattainment areas) as opposed to 80 million (based on those counties with air quality data that exceeded at least one NAAQS in 1995). There are two reasons for this difference in population estimates. First,

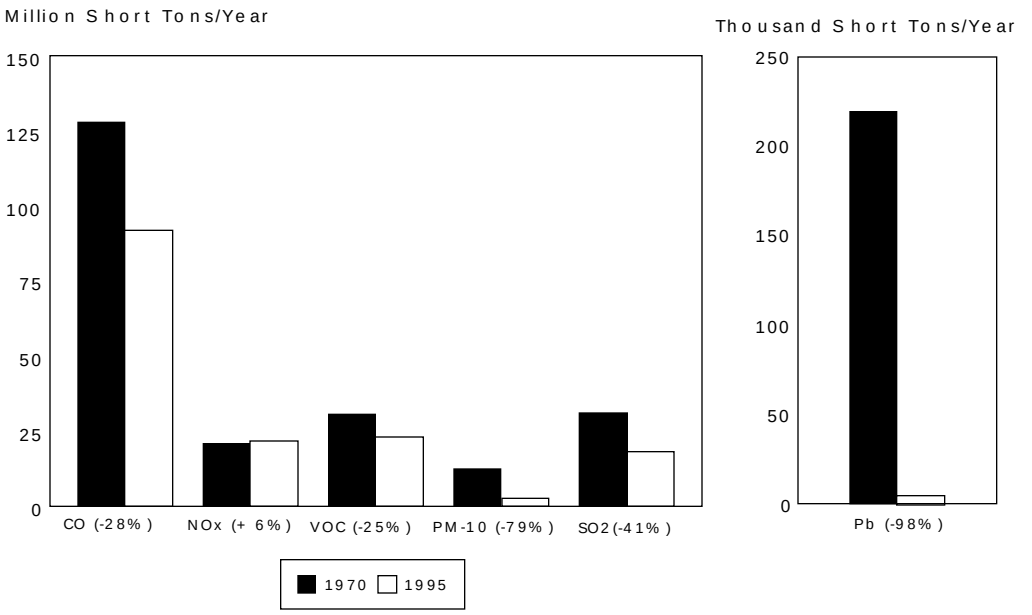

Figure 1-1. *Summary of emissions changes for all six NAAQS pollutants between 1970 and 1995.*

formal designations particularly for ozone may encompass entire metropolitan areas rather than just the county with the monitor. Second, formal designations are based on multiple years of data (rather than the most recent calender year) to account for a broader range of meteorological conditions.

While this report emphasizes trends in the six criteria pollutants, it also features information on related topics. Chapter 3 highlights the expanding Photochemical Assessment Monitoring Stations (PAMS) program, which is an intensive monitoring network set up to increase our knowledge of the underlying causes of ozone pollution and potential control strategies. PAMS monitoring sites are located in all ozone nonattainment areas classified as serious, severe, or extreme nonattainment areas. The 22 affected areas collect measurements of ozone, NO_x, and VOCs, as well as surface and upper air meteorology. While the hot dry summer in 1995 resulted in increases in ozone levels in many parts of the country between 1994 and 1995, the majority of the PAMS sites showed decreases in the

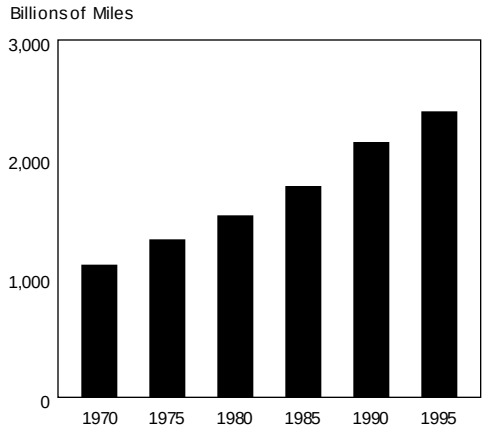

Figure 1-3. *Total U.S. vehicle miles traveled, 1970–1995.*

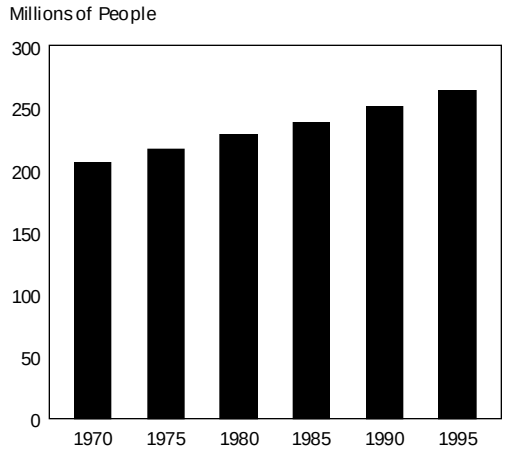

Figure 1-2. *Total U.S. population, 1970–1995.*

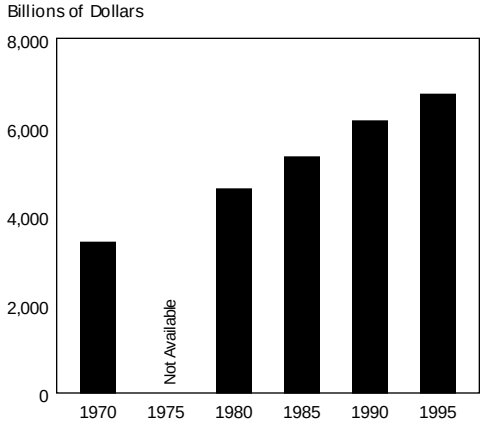

Figure 1-4. *Total U.S. gross domestic product, 1970–1995.*

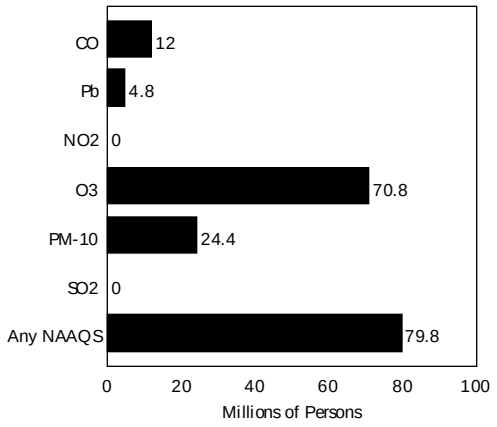

Figure 1-5. *Number of people living in counties with air quality levels above the NAAQS in 1995.*

concentrations of toxics and ozone-forming VOCs. Under more normal summertime conditions, meteorological conditions such VOC reductions would likely lead to decreases in ozone levels.

Chapter 4 presents information on air toxics, another set of pollutants regulated under the Clean Air Act which are known to cause, or suspected of causing, cancer or other serious health effects. This is the first year EPA has reported air toxic emissions based on the new, more extensive National Toxics Inventory (NTI). Data from the Toxics Release Inventory (TRI) were used as the foundation of this new national inventory. The development of NTI represents a significant improvement in characterization of air toxics because NTI shows that mobile and areas sources, which are not included in TRI, account for 70 percent of hazardous air pollutant emissions.

Chapter 5 summarizes the current status of nonattainment areas (those not meeting ambient air quality standards). Under the Clean Air Act Amendments of 1990, there were 274 areas designated nonattainment for at least one ambient standard. As of September 1996, 174 areas are still designated nonattainment, with particulate matter having the largest number (81), and ozone the second largest number (68) of areas. The current nonattainment areas for each criteria pollutant are displayed on one map in this chapter, while a second map depicts ozone nonattainment areas alone, color-coded to indicate the severity of the ozone problem in each area.

Chapter 6 characterizes air quality on a more local level in three ways. First, the chapter lists peak statistics for 1995 for each Metropolitan Statistical Area (MSA). Second, 10-year trends are assessed for each MSA using a statistical method which is new to this year's report. The results show that 16 MSAs have a statistically significant upward trend in at least one criteria pollutant, while 204 MSAs have a statistically significant downward trend in at least one criteria pollutant. The third way in which local air quality is evaluated is by looking at the Pollutant Standards Index (PSI) for the nation's 94 largest MSAs. The PSI analysis shows that between 1986 and 1995 the total number of "unhealthful" days decreased 54 percent in Los Angeles, 35 percent in Riverside, California, and 58 percent in the remaining major cities across the United States.

Finally, expanded tables of the air quality concentrations and emissions data described throughout this report are provided in Appendix A. Appendix B summarizes the methodology which is the basis for the trends statistics presented throughout this report, and also provides maps of the current monitoring network for each criteria pollutant.

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